



Voluntary Cleanup for Ag-Chem Facilities

Hazardous Waste Program fact sheet

6/2003

When commercial and industrial property is transferred, lending institutions often require an environmental assessment as a result of Clean Water Act, Resource Conservation and Recovery Act and Superfund liability laws. If contamination is found, owners, buyers and tenants frequently request guidance from the Missouri Department of Natural Resources in cleaning up the site. For fertilizer or agrichemical facilities, contamination may include concentrations of herbicides, pesticides, excess nutrients such as nitrogen, phosphorus or potassium, and metals. If you are in this situation, what can you do about it?

Legislation established the Voluntary Cleanup Program (VCP), a non-enforcement program designed to help evaluate sites and cleanup processes. The program provides a reasonable cleanup approach based on land use and off-site impacts. Following a complete cleanup, Department of Natural Resources issues a certification of completion letter to the facility (called a "clean letter") stating that the site meets standards for cleanup and that no further action is needed at the site relating to the contamination. Participation in the Voluntary Cleanup Program is entirely voluntary.

For various reasons, a small number of sites have not been allowed to participate in the program. At some sites remedial actions were already underway or completed before the site applied for participation. Some applicants had sites at which regulated underground storage tanks were found. In these cases, the sites were transferred to the Tanks Section of Department of Natural Resources.

Facility owners, such as fertilizer and agrichemical dealers, may use the Voluntary Cleanup Program at any time; however, it usually is used in conjunction with a real estate sales transaction. The program simplifies property transfers and redevelopment by providing assurances to interested parties that the cleanup is completed to Department of Natural Resources's satisfaction. Department of Natural Resources stands ready to assist facility owners that may have contaminated property to begin the cleanup process.

Program personnel evaluate applications and approve appropriate and workable plans that will remove or reduce contamination. The Voluntary Cleanup Program determines cleanup levels based on a guidance document Cleanup Levels for Missouri (CALM). The CALM document provides a "risk-based" approach to establishing cleanup standards. For more information on the CALM document, contact the Voluntary Cleanup Program directly at (573) 526-8913.

Facility personnel may accomplish the cleanup; however, facilities usually use environmental contractors and consultants (consulting companies). Under Department of Natural Resources oversight, the applicant completes a proposed remedial action plan.

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To help you understand the process, we have developed three possible cleanup scenarios a company may encounter at agrichemical or fertilizer facilities.

There are costs associated with the program. The scenarios include costs that are fairly uniform on a statewide basis, such as Department of Natural Resources oversight fees and consultant fees. The program participants are charged an hourly fee for Department of Natural Resources oversight. An application fee of \$200 and an oversight deposit not to exceed \$5,000 are required. Department of Natural Resources charges personnel and travel costs against these deposits and returns any remaining funds to the applicant upon completion of the cleanup. Department of Natural Resources oversight costs will vary depending on the complexity of the cleanup, but oversight costs have averaged approximately \$2,500 for most sites.

The costs incurred for any consulting, engineering, permitting or legal services, as well as the actual cleanup costs, are the responsibility of the participant. Cleanup costs are both contaminant and site-specific and may vary from those included in the examples. The costs for any cleanup will depend on, but are not limited to, the volume of the contamination, the nature of the chemical being cleaned up, tipping fees at landfills, fees charged by wastewater treatment plants, and so forth. A list of some of the factors to consider is included with each scenario. Because there are so many variables, the costs included in the scenarios should be regarded as estimates only. Actual costs may vary significantly.

The benefit to the facility of VCP participation comes in the form of increased property value and decreased liability. Through a Memorandum of Agreement, the U.S. Environmental Protection Agency also recognizes cleanups conducted under the Voluntary Cleanup Program and generally considers the sites to warrant no further action for the contamination addressed. A voluntary cleanup plan may also be simpler than one ordered by Department of Natural Resources or the Environmental Protection Agency. For example, a voluntary plan may require fewer soil samples and groundwater monitoring wells than an ordered cleanup. Most importantly, there is also a benefit to public health and the environment by protecting the water, soil, and air from hazardous substances.

Agricultural Chemical Site Scenario One

Introduction

The site is a small sales facility that has operated for 30 years. The site has a storage building for fertilizer, seeds, drummed liquid and dry chemicals. Also on the property are two liquid chemical aboveground storage tanks, a tank for mixing and loading liquid chemicals, an anhydrous ammonia tank and a storage area for anhydrous ammonia nurse tanks.

The owner plans to sell the property and has a prospective buyer. However, the buyer's lender will not make a loan until a site assessment has been conducted and any contamination found has been cleaned up. Consequently, the owner enlisted the services of an environmental consulting company to investigate the property and subsequently enrolled the site in the VCP.

Investigation

The consulting company began its investigation by discussing the site operations with the owner and operator of the facility. The owner said minor spills of fertilizer and liquid chemicals happened from time to time, but there were no major spills. The consultant next prepared a sampling and analysis plan. Borings were taken at three locations. The consultant also

collected soil samples from the surface to 18 inches. All of the soil samples were analyzed for pesticides/herbicides, nitrates, ammonia and total metals.

Investigation Findings

The consultant found elevated levels of 2,4-D; atrazine; carbon disulfide; zinc; and lead in the soils. Only atrazine and lead were found at concentrations exceeding the Voluntary Cleanup Program cleanup levels. No contamination was found below 18 inches.

Additional Investigation Necessary

Additional sampling was conducted to further define the area of contamination. Additional samples determined approximately 350 cubic yards (70 feet by 90 feet to a depth of 1.5 feet) contained atrazine and lead at concentrations exceeding the Voluntary Cleanup Program's cleanup levels. Because the contamination was shallow and groundwater at the site is at a depth of approximately 40 feet, the contamination did not pose a threat to ground water. Therefore, no investigations were undertaken to sample groundwater.

Cleanup Options

Two cleanup options were available: 1) Excavate the soil and dispose of it off-site, or 2) Cap the contaminated area with an impermeable cap and place a restrictive covenant in the property chain of title. The latter option would limit the use of the property because the capped area could not be disturbed unless the contaminated soils were removed. This option also involved future monitoring and inspection by the Department of Natural Resources and associated costs.

The owner decided to pursue the first option and excavate the soil. The excavated soil, about 350 cubic yards, was disposed at a local sanitary landfill as a special waste. This was allowable because atrazine is not a hazardous waste and the concentrations of lead in the soil were not high enough to cause the soil to be considered a hazardous waste.

After excavation was complete, the consultant analyzed six samples from the excavation for lead and atrazine. The levels detected in the verification samples were below the Voluntary Cleanup Program's cleanup levels. Therefore the excavation was backfilled with clean dirt, compacted and surfaced with gravel. No further cleanup actions were necessary, and Department of Natural Resources issued a clean letter to the property owner.

Cleanup Costs

Department of Natural Resources oversight costs for a project of this size would probably range from \$1,000 to \$2,000. Consultant fees may range from \$3,000 to \$6,000. Sample analysis costs range from \$125 to \$250 per sample for pesticides and up to approximately \$190 per sample for total metals. Additional site-specific costs included excavation, transportation of the excavated soil, tipping fees at the landfill, and backfill with clean dirt. Total cleanup costs could range from \$17,000 to \$31,000.

Agricultural Chemical Site Scenario Two

Introduction

The site is a facility that has operated for 25 years. The site has a storage building for fertilizer, seeds, drummed liquid chemicals and dry chemicals. In addition, three bulk storage tanks are on the site: a diesel fuel tank, a liquid chemical tank and a mix tank. Other storage areas include grain storage bins, anhydrous tanks and an equipment storage shed.

The facility has been sold to a large agribusiness firm. After the sale, the new owner decided to investigate the environmental condition of the site to determine if any contamination problems exist, and to seek the assistance of the VCP.

Investigation

The environmental management department of the agribusiness performed an investigation and prepared a site sampling and analysis plan. The plan called for placement of six borings on the site, with two of the six to be converted to monitoring wells to investigate groundwater conditions. All of the soil and groundwater samples were analyzed for herbicides/pesticides, nitrates, ammonia and total metals.

Investigation Findings

The only contaminant detected at levels of concern was nitrate nitrogen. The nitrates were in soil in an area where fertilizers had been historically stored. The nitrates, a form of nitrogen known to be very mobile, were detected at elevated levels in an area about 120 feet by 80 feet, to a depth of 3.5 feet. Very tight clay soils apparently prevented further vertical migration. Groundwater, found at a depth of 38 feet, was not affected.

Additional investigations were conducted to describe contaminated area. Six additional borings were placed around the previously identified area of contamination. These borings more accurately identified the boundaries of the affected area.

Cleanup Options

Two cleanup options were available: 1) Excavate the soil and dispose of it off-site in a permitted landfill; or 2) Excavate the soil and land apply the material. The owner chose the second option.

The Department of Natural Resources required the owner to apply to the Water Pollution Control Program for a land application permit before the contaminated soil could be land applied. In response, the applicant submitted a land application plan with the permit application.

Soil contaminated only with nitrogen/phosphorus could be land applied by following normal agricultural rates for nutrients. However, a special precaution is needed for nitrate nitrogen, which is very mobile. The department approved a rate of application equal to 10 percent of the total plant nitrogen needs. Once the permit was issued, the owner had the soil excavated and land applied. Land application of the contaminated soil was accomplished by using a spreader. After application, the contaminated soil was tilled into the soil before planting. The owner was able to land apply all of the contaminated soil, a total of 1,250 cubic yards, at once due to his access to the appropriate amount of acreage.

Once the contaminated soil was excavated, the environmental management department collected confirmation samples across the excavation to ensure all of the contaminated soil had been removed. After it was established that all of the contamination had been removed, the excavation was backfilled with clean soil and gravel. No further cleanup actions were necessary and Department of Natural Resources issued a clean letter to the property owner.

Cleanup Costs

For this scenario, Department of Natural Resources oversight costs would probably range from \$1,000 to \$1,500. Sample analysis costs range from \$125 to \$250 per sample for pesticides and up to approximately \$190 per sample for total metals. The land application permit fee is \$1,500.

Additional costs to be considered include labor costs for the agribusiness' environmental management department and equipment time and labor to excavate, truck and land apply the soil. Total cleanup costs could range from \$16,000 to \$21,000.

Agricultural Chemical Site Scenario Three

Introduction

The site has operated for 25 years. A tank farm, a mixing and load out tank, storage bunkers for dry fertilizer, anhydrous ammonia tanks, grain bins, an aboveground diesel fuel storage tank and a warehouse for storage of dry and liquid drummed chemicals, seed and mechanical parts are found on the site.

The current owner wants to expand the facility and requires a bank loan to do so. However, the owner's lender will not make a loan until a site assessment has been conducted and any contamination has been cleaned up. Therefore, the owner hired an environmental consultant and sought the assistance of the VCP.

Investigation

A record review determined that a number of different pesticides, now banned, had been handled at the site. Contamination from these chemicals, the bulk chemical tanks and the fertilizer bunkers is of concern and warrants further investigation.

To investigate the site, borings were taken around the bulk tanks, the fertilizer bunkers and in an area where sprayers had been routinely cleaned out. One boring in each area was extended to groundwater and monitoring wells were installed. Soil and groundwater samples were collected and analyzed for herbicides and pesticides, petroleum and total metals.

Investigation Results

The analyses found chlordane, zinc, trifluralin, atrazine, metribuzin and 2,4D at elevated levels in the soil, and atrazine, 2,4-D and nitrates in groundwater. Chlordane, trifluralin and atrazine concentrations exceeded the Voluntary Cleanup Program's cleanup level for soil, while 2,4-D and atrazine exceeded the program's cleanup levels for groundwater.

Additional Investigation

Additional sampling was conducted to further define the areas of soil and water contamination. Soil samples determined approximately 3,550 cubic yards (200 feet by 120 feet to a depth of four feet) of soil-contained chlordane, trifluralin and atrazine exceeding the Voluntary Cleanup Program's cleanup levels. Additional wells were installed that showed the groundwater plume to be approximately 540 feet long and 110 feet wide.

Cleanup Options

Because chlordane concentrations caused the soil to be a hazardous waste, cleanup options were limited. Land farming of the soil was not an option. Therefore, the soil was excavated and disposed of at a hazardous waste facility. After about 3,000 cubic yards of soil were excavated, soil samples determined that all contaminant levels were below the Voluntary Cleanup Program's cleanup levels. The excavation was then backfilled with clean soil.

The 2,4-D and atrazine in groundwater also required remediation. Pumping the groundwater from the ground and disposing of it at a publicly owned treatment works (POTW) was the most desirable and cost efficient remedial option. Disposal at the POTW was allowable because the concentrations of 2,4-D and atrazine in groundwater were low enough to allow the water to be safely accepted at the facility. Pumps were installed in three wells and groundwater was pumped from the wells into the sanitary sewer. The two-year data found the plume had reduced in size and that about three more years of pumping would likely be required to reduce the contaminant concentrations to acceptable levels. The data will be periodically reviewed to determine when a clean letter can be issued.

Cleanup Costs

Department of Natural Resources oversight costs for a project of this size and complexity would probably range from \$2,000 to \$5,000. Consultant fees may range from \$8,000 to \$15,000. Sample analysis costs range from \$125 to \$250 per sample for pesticides and up to approximately \$190 per sample for total metals. Additional costs to be considered are costs for excavation and transportation of the soil, disposal fees at a hazardous waste facility, backfilling with clean soil, pump installation, and POTW charges to accept the water. Total cleanup costs could range from \$1.2 to \$2 million.

Because cleanup costs for this scenario are high, the facility owner may want to discuss other options with the Department of Natural Resources. One option to consider is leaving the contamination in place and capping the area to prevent exposure and rainwater infiltration. However, leaving the contamination in place requires land use restrictions in the form of a restrictive covenant filed in the chain of title. Since these chemicals are hazardous waste, the site may be placed on the Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites in Missouri Registry). Another option would be for the facility owner to propose Alternate Cleanup standards and support them with a site specific risk assessment. These options would not, however, alleviate the need for groundwater remediation.

If you would like more information regarding the Voluntary Cleanup Program, call Department of Natural Resources at 1-800-361-4827 or (573) 526-8913, or Missouri Ag Industries Council at (573) 636-6130.

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